



UNITED STATES PATENT AND TRADEMARK OFFICE

NV

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

09/854,539

05/14/2001

Steven Towle

884.415US1

8328

7590

10/20/2004

Schwegman, Lunberg, Woessner & Kluth, P.A.
P.O. Box 2938
Minneapolis, MN 55402

EXAMINER

PERALTA, GINETTE

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 10/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/854,539

Applicant(s)

TOWLE, STEVEN

Examiner

Ginette Peralta

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 and 25-31 is/are pending in the application.
- 4a) Of the above claim(s) 4,6-8,12-17 and 25-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5 and 9-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3, and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marrs et al. (U. S. Pat. 5,355,283) in view of Goldstein et al. (U. S. Pat. 5,904,955).

Regarding claim 1, Marrs et al. discloses in Fig. 5 a microelectronic device comprising a package core 502 having an opening therein; a microelectronic die 501 located within the opening of the package core 502; and an encapsulation material 503 within the opening of the package core to hold the microelectronic die within the package core 502, the encapsulation material including a polymeric resin more specifically a molding or potting resin such as epoxy (col. 8, ll. 30-35).

Marrs et al. disclosed the claimed invention with the exception of using a fiber reinforced encapsulation material.

Goldstein et al. discloses in col. 3, lines 50-61, a microelectronic device featuring a fiber reinforced encapsulation material used in microelectronic device package to hold a microelectronic die within the package, the fiber reinforced encapsulation material

including a polymeric resin having a fibrous filler material wherein the fiber reinforced encapsulation material is taught and used for the disclosed intended purpose of providing a molding using resin that has an improved adhesion to the structure in order to preserve the integrity of the package wherein the material is chosen depending on desired characteristics such as temperature dependence, gas permeability, expansion coefficient, and others as discussed in column 1, lines 37-45 and column 3, lines 50-61.

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a fiber reinforced polymeric resin as the one taught by Goldstein et al. as the molding resin of Marrs et al. for the disclosed intended purpose of Sawada of providing a molding using resin that has an improved adhesion to the structure in order to preserve the integrity of the package wherein the material is chosen depending on desired characteristics such as temperature dependence, gas permeability, expansion coefficient, and others, and furthermore providing an encapsulant capable of good mechanical properties, having high heat distortion temperatures, and providing cured products exhibiting reduced shrinkage and improved surface appearance.

Regarding claims 2 and 3, Goldstein et al. does not disclose the fibers length or width. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to depending on the use of the fiber reinforced resin to vary the length of the particles of individual fibers, as there is no statement denoting the

criticality of the fiber width and thickness and as Sawada discloses that the fibers are part of a molding used to encapsulate a semiconductor die.

"In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990) (The prior art taught carbon monoxide concentrations of "about 1-5%" while the claim was limited to "more than 5%." The court held that "about 1-5%" allowed for concentrations slightly above 5% thus the ranges overlapped.)" (MPEP 2144.04)

Regarding claims 9 and 10, Marrs et al. and Goldstein et al. disclose the polymeric resin including epoxy or a plastic.

Regarding claim 11, Marrs et al. discloses the structure further comprising a metallization layer 504 built up over the package core 502, the metallization layer being conductively coupled to bond pads 508 on a surface of the microelectronic die.

3. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marrs et al. in view of Goldstein et al. as applied to claims 1-3 and 9-11 above, and further in view of Sawada et al..

Marrs et al. as modified by Goldstein et al. discloses that the fibrous filler material may be glass, ceramic or fibers, but does not specify the type of fibers used.

Sawada discloses in column 5, lines 21-28, that the fibrous filler material includes carbon-containing fibers or glass, wherein the filling material is used for the disclosed intended purpose of the disclosed intended purpose of providing a molding using resin having a smaller coefficient of thermal expansion so that a package having high mechanical strength and small thermal stress is obtained.

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a carbon fiber in the reinforced polymeric resin of Marrs et al as modified by Goldstein et al. and Sawada et al. as the molding resin of Marrs et al. for the disclosed intended purpose of Sawada and Goldstein et al. of providing a molding using resin having a smaller coefficient of thermal expansion so that a package having high mechanical strength and small thermal stress is obtained , and furthermore providing an encapsulant capable of good mechanical properties, having high heat distortion temperatures, and providing cured products exhibiting reduced shrinkage and improved surface appearance.

Response to Arguments

4. Applicant's arguments with respect to claims 1-3, 5, and 9-11 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ginette Peralta whose telephone number is (571) 272-1713. The examiner can normally be reached on Monday to Friday 8:00 AM- 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

GP

Wael F. Elmaghrabi
SP# 2814